

ELY et al  
Serial No. Unassigned

Page 60, line 1, change "CLAIMS" to

--WHAT IS CLAIMED IS:--.

**IN THE CLAIMS**

Cancel original claims 1-73 without prejudice or disclaimer in favor of new claims 74-90:

--74. (New) A positioning system comprising:

a substantially planar array of x-y coils;

an electromagnetic field generator whose height above the planar x-y coils can vary and operable to generate an electromagnetic field; and

processing circuitry coupled to the substantially planar x-y coils and operable to process signals generated by the x-y coils in response to the electromagnetic field generated by said field generator to determine a measure of the height of the field generator above the planar coils.

75. (New) A system according to claim 74 comprising a plurality of x sensor coils and a plurality of y sensor coils.

76. (New) A system according to claim 74 wherein said processing circuitry is also operable to process said generated signals to determine an x-y position of said field generator relative to said x-y sensor coils.

77. (New) A system according to claim 76 wherein said processing circuitry is operable to determine the x-y position of said field generator over a predetermined measurement area.

78. (New) A system according to claim 77 wherein the or each x sensor winding and the or each y sensor winding extends substantially over the entire measurement area.

79. (New) A system according to claim 78 wherein the or each x sensor winding and the or each y sensor winding comprises at least two loops connected in series and arranged so that a signal generated in the first loop opposes the signal generated in a second loop by a common background electromagnetic field.

80. (New) A system according to claim 74 wherein said signal generator is operable to generate an alternating magnetic field which induces alternating signals in said x-y sensor coils and wherein said processing circuitry is operable to determine an amplitude measure for the signal generated in one or more of said sensor coils and is operable to determine said height measure from said amplitude measure.

81. (New) A system according to claim 80 wherein said processing circuitry is operable to combine the signals generated in two of the sensor coils to provide an amplitude measure which varies with the height of the signal generator above the planar x-y sensor windings and wherein said processing circuitry is operable to determine said height measure from said amplitude measure.

82. (New) A system according to claim 80 wherein said processing circuitry is operable to take a ratio of first and second amplitude measures and is operable to determine said height measure using said ratio.

83. (New) A system according to claim 74 wherein said signal generator comprises a magnetic field generator operable to generate an alternating magnetic field.

84. (New) A system according to claim 74 wherein said signal generator comprises an electromagnetic resonator and further comprising an energizing circuit for energizing said resonator.

85. (New) A system according to claim 84 wherein said energizing circuit comprises one or more of said x-y coils.

86. (New) A positioning system comprising:  
a planar array of x-y sensor coils distributed over an x-y measurement area;  
a field generator which is movable relative to said planar array of x-y coils and which is operable to generate an electromagnetic field; and

processing circuitry coupled to said x-y sensor coils and operable to process signals generated in x-y sensor coils in response to the electromagnetic field generated by said field generator, to determine the x-y position of said field generator within said x-y measurement area and to determine a measure of height of the field generator from the planar array of x-y sensor coils;

wherein said signals generated in said x-y sensor coils vary with the x-y position and said height, wherein said processing circuitry is operable to combine the signals generated in two or more of said sensor coils to derive an amplitude measure which is independent of said x-y position and which varies with said height and wherein said processing circuitry is operable to process said amplitude measure to determine said height measure of the field generator relative to said planar coils.

87. (New) A system according to claim 86 comprising a sin x sensor circuit and a cos x sensor circuit which are operable to generate signals which vary in quadrature with the x position of the field generator relative to said x-y measurement area and wherein said processing circuitry is operable to take the square of a signal generated by the sin x sensor circuit and the square of a signal generated in the cos x sensor circuit and to add the results to provide said amplitude measure, from which said height measure of the field generator relative to said planar coils is determined.

88. (New) A system according to claim 86 wherein said processing circuitry is operable to process said signals induced in said sensor coils to determine first and second amplitude measures which vary with the height of the field generator relative to the planar sensor coils and wherein said processing circuitry is operable to take a ratio of said first and second amplitude measures to determine said height measure.

89. (New) A system according to claim 86 wherein said field generator comprises a powered coil.

90. (New) A system according to claim 86 wherein said field generator comprises a resonator and further comprising an energizing circuit for energizing said resonator.--